

AMENDMENT UNDER 37 C.F.R. § 1.116
U.S. Application No. 09/881,089
Attorney Docket No. Q64816

REMARKS

Claims 1-17 have been examined. Claims 18-24 have been withdrawn from consideration as being directed to a non-elected invention. Therefore, claims 1-24 are all the claims pending in the application.

As a preliminary matter, Applicants' representative would like to thank the Examiner for courtesies extended in the productive telephone interview of March 7, 2003. In the interview, the Lund and Yasutaka references were discussed, as well as some of Applicants' proposed amendments for more clearly defining the features of the claimed invention.

Additionally, with respect to the Restriction Requirement, Applicants confirm the election of claims 1-17 for examination.

I. Claims 1-3 and 6-17:

The Examiner rejects claims 1-3 and 6-17 under 35 U.S.C. § 103(a) as being obvious over Lund (U.S. Patent No. 3,453,468) and Yasutaka (JP 63-194543). For at least the following reasons, Applicants traverse this rejection.

As a preliminary matter, Applicants amend the claims to more thoroughly define the features of the present invention.

It is settled law that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. See *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). That is, although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." See *id.* Obviousness can only be established

by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art (see MPEP § 2143.01).

With respect to claims 1-3 and 6-17, the Examiner alleges that Lund discloses most of the features of the claimed invention. However, the Examiner concedes that Lund does not disclose that a cross-section of at least a principal portion of the stator coil inside the slots is approximately rectangular, a cross-section of at least a portion including end portions of the coil end is approximately circular or approximately elliptic, and a cross-sectional area of the approximately rectangular cross-sectional portion differs from that of the approximately circular cross-sectional portion or the approximately elliptic cross-sectional portion, as recited in claim 1.

Therefore, to make up for the deficiencies of Lund, the Examiner cites Yasutaka. In particular, the Examiner alleges that Yasutaka discloses a cross-section of at least a portion including end portions of the coil end being approximately circular or approximately elliptic (see Figure 5), and that a cross sectional area of the approximately rectangular cross-sectional portion differs from that of the approximately circular cross-sectional portion or the approximately elliptic cross-sectional portion for the purpose of reducing heat. To this end, the Examiner alleges that, since Lund and Yasutaka are from the same field of endeavor, it would have been obvious to combine Lund and Yasutaka "for the purpose of reducing heat" (see Office Action, page 4, first full paragraph). Applicants respectfully disagree with the Examiner's position.

Applicant submits that, even though the coil ends of Lund are aligned, the two coil ends of the coil that are inserted into the adjoined slot of Lund are mutually apart. As such, in Lund, a short between adjacent coil ends caused by contact between the adjacent coil ends is not a concern. In fact, Lund does not even contemplate the problems of preventing a short-circuit between adjacent coil ends or reducing the height of a coil end, both of which the present invention solves.

Moreover, the coil of Yasutaka is concentrated around one tooth and the conductors do not cross at a coil end. Thus, Yasutaka, like Lund, also does not contemplate the problems of preventing a short-circuit between adjacent coil ends or reducing the height of a coil end, which the present invention solves.

Furthermore, contrary to the Examiner's position, Applicants submit that Yasutaka does not contemplate that "heat" is reduced based on the cross-section of the coils. In fact, Yasutaka only mentions "heat" with reference to the electrically insulating sheet 8, which has a high degree of heat resistance and is interposed between the stator core 2 and the stator winding 7. Thus, Applicants submit that Yasutaka clearly does not disclose or suggest that the cross-section of the coils is effective in reducing heat. Moreover, Lund also does not contemplate whether the cross-section of the coil is effective in reducing heat.

Therefore, for at least the foregoing reasons, Applicants submit that the Examiner has not established a reasonable motivation or suggestion in either Lund, Yasutaka, or the art in general, for modifying Lund based on the teachings of Yasutaka to arrive at the claimed invention. Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness has not been

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established, at least with respect to claims 1-3 and 6-17; and thus, the § 103(a) rejection of these claims should be withdrawn.

However, assuming *arguendo* that a motivation or suggestion to modify Lund based on Yasutaka exists, Applicants submit that the resulting combination would neither disclose nor suggest all of the recitations of independent claim 1. For example, claim 1 recites, *inter alia*, that “a cross-sectional area of said approximately rectangular cross-sectional portion *differs* from that of said approximately circular cross-sectional portion or said approximately elliptic cross-sectional portion” (emphasis added). In particular, the present invention solves at least one problem with conventional devices, wherein adjacent conductors contact one another at corner portions thereof, thereby damaging an insulating coating and causing short-circuiting of the coil ends. For example, the present invention provides a stator for an alternator in which it is possible to increase a space factor of a stator coil in slots and increase a cross-sectional area of the stator coil and thus, a resistance of the stator coil may be reduced and an output voltage increased. According to the present invention, it is difficult for the conductors to interfere with one another at coil ends; therefore, a height of the coils ends can be reduced and the size of the entire alternator also can be reduced. Thus, since it is possible to reduce the height of the coil ends, coil resistance and coil end leakage inductance may be reduced and output may be increased (see page 3 of Applicants’ specification.). Furthermore, even in situations where the conductors contact one another, since the conductors are of an approximately circular cross section with a large radius of curvature, the contact stress is small and it is difficult for the insulating coating to become damaged.

In the present Office Action, the Examiner alleges that Yasutaka makes up for the deficiencies of Lund by disclosing that a cross-sectional area of the rectangular conductors inside the slots is larger than a cross-sectional area of the round conductors outside the slots. For at least the following reasons, Applicants respectfully disagree with the Examiner's position.

Applicants submit that the proportions of the features in a drawing are not evidence of actual proportions when drawings are not to scale. That is, when a reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. See *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000); see also, MPEP § 2125. Therefore, since Yasutaka does not disclose that the drawings are to scale, the mere appearance that the cross-sectional area of the rectangular portion is larger than the cross-sectional area of the round portion is not sufficient to establish that such is the case. Thus, Applicants submit that Yasutaka does not disclose or suggest at least this recitation.

Additionally, Applicants submit that Yasutaka merely discloses that a round coil, which can be either solid or hollow, is pressed into a rectangular shape in a hydraulic presser (as shown in Fig. 4) and fitted into the rectangular shaped slots. That is, the method of Yasutaka, which crushes the coil in the slot, can improve the space factor of the coil *in the slot*. However, the method of Yasutaka cannot crush the coil *of the coil end*. Therefore, the thickness of the coil end remains large, thus making it difficult to achieve the claimed construction.

Furthermore, the cross-sectional area of the coil in the slot is not changed by Yasutaka, even through the method of Yasutaka can improve the space factor of the coil *in the slot*. Thus,

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the cross-sectional area of the coil inside the slot is the same as outside the slot. That is, the cross-sectional area of the approximately rectangular cross-sectional portion is the same as the cross-sectional area of the approximately elliptic cross-sectional portion.

Accordingly, Applicants submit that any combination of Lund and Yasutaka would (at best) result in a stator coil having a rectangular cross-sectional area that is equal to the original round cross-sectional area of the coil. Thus, even if Yasutaka were combined with Lund, the large cross-sectional area of the round portion of the coil disclosed by Yasutaka would make it difficult to arrive at the claimed structure. That is, the resulting combination would not solve the problem of interference between the conductors at the coil ends. Accordingly, Applicants submit that any combination of Lund and Yasutaka clearly does not (and cannot) disclose or suggest all of the recitations of claim 1; and therefore, the § 103(a) rejection of claim 1 should be withdrawn.

Additionally, Applicants submit that dependent claims 2, 3, and 6-17 also are patentable over any combination of Lund and Yasutaka at least by virtue of their dependency from claim 1.

Furthermore, Applicants submit that claims 2, 3, and 6-17 are separately and independently patentable over any combination of Lund and Yasutaka at least by virtue of the additional recitations recited therein.

For example, claim 6 recites, *inter alia*, a "continuous conductor comprising a plurality of turn portions being bent back outside said slots at both sides of said stator core, and each successive one of said plurality of turn portions of said continuous conductor being disposed on alternating sides of said stator core." Applicants submit that neither Lund nor Yasutaka, either

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alone or in combination, discloses or suggests at least this recitation. On the contrary, both Lund and Yasutaka disclose coils that merely are wound around the stator coil in a generally circular form. Thus, Applicants submit that any combination of Lund and Yasutaka clearly does not disclose or suggest at least this recitation of claim 6, and accordingly, claim 6 is separately and independently patentable over the applied references.

Moreover, Applicants submit that claim 9 is separately and independently patentable over any combination of Lund and Yasutaka. Applicants note that Claim 9 is amended merely to rewrite claim 9 in independent form, including all of the limitations of base claim 1. With respect to claim 9, the Examiner maintains the position that Yasutaka discloses a hardness of said conductors of said coil ends being less than that of said conductors in said slots, as recited in claim 9. However, the Examiner does not provide any support for this statement, nor has the Examiner responded to Applicants' traversal position. In fact, Applicants submit that Yasutaka is completely silent with respect to the hardness of the conductors and the coil ends. Therefore, Applicants submit that Yasutaka neither discloses nor suggests at least this recitation of claim 9, and accordingly, does not (and cannot) make up for the deficiencies of Lund. Thus, independent claim 9 is separately and independently patentable over any combination of Lund and Yasutaka and the § 103 rejection of claim 9 also should be withdrawn.

II. Claims 4 and 5:

The Examiner maintains the rejection of claims 4 and 5 under 35 U.S.C. § 103(a) as being obvious over Lund, Yasutaka, and Kobayashi (U.S. Patent No. 4,827,172). For reasons analogous to the reasons set forth above with respect to independent claim 1, Applicants submit

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that the neither Lund nor Yasutaka, either alone or in combination, discloses or suggests all of the recitations of claim 1, from which claims 4 and 5 depend. Additionally, Applicants submit that Kabayashi does not make up for the deficiencies of Lund and Yasutaka; and therefore, claims 4 and 5 are patentable over any combination of Lund, Yasutaka, and Kobayashi. Accordingly, the § 103(a) rejection of claims 4 and 5 should be withdrawn.

Furthermore, Applicants submit that claims 4 and 5 are separately and independently patentable over the applied references at least by virtue of the additional recitations recited therein. For example, claim 4 recites, *inter alia*, “a plurality of U-shaped conductor segments, end portions thereof being joined to each other, said end portions being bent outside said slots at an axial end surface of said stator core, said end portions comprising a portion that is inclined with respect to an outer circumferential surface of said stator core and a portion that is perpendicular to said outer circumferential surface of said stator core so as to align in rows in a circumferential direction and form coil end groups, and said straight portions of said end portions are joined to each other.” Applicants submit that neither Lund, Yasutaka, nor Kobayashi, either alone or in combination, discloses or suggests at least this claimed combination.

III. Conclusion


In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

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Respectfully submitted,

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